approach

FEBRUARY 1983 THE NAVAL AVIATION SAFETY REVIEW

Some Grace Under Pressure

IT was all bloody wonderful for the PAOs. Handshakes in the base newspapers. Cake cuttings and white icing for returning detachments that had racked up zillions of vacant flight hours while droning behind *Rayban* sunglasses.

"Once again, Det 3 was astonishing, unbelievable . . !" As usual.

This little story concerns a flight time derby. You've heard about flight time derbies, haven't you? Where squadrons compete for flight hours so they can shine in their end-of-the-year reports?

Once upon a time, several squadrons were engaged in a silent competition to win the Battle E. The stage was set for one-upmanship, and with each detachment, new flight time milestones were recorded.

Being in a flight time derby is like riding on a merry-go-round, where everything starts spinning faster and faster and the preflights start to blur and then you have a mishap.

Luckily, one squadron CO decided to call it quits, and he was smart enough to do so before any of his aircraft crashed. He learned his squadron was getting dizzy when his safety officer took a poll in the readyroom. "Pilots (LT and below) to a man indicated that their central goal in flying was to accumulate flight hours," the safety officer told us. It didn't matter what kind of hours they were, just hours. It was a cardinal sin to return to base before the low fuel warning lights flickered on.

Alarmed, the CO and XO started pulling their pilots off the merry-go-round. They splashed water in their faces. And in the squadron's end-of-the-year report to the almighty Wing, the first line read like this: "In this squadron, flight time is used for quality, not quantity."

The squadron lagged behind its sister squadrons in terms of total flight hours, and they were proud of it. By quality, they meant things like meaningful night and instrument time. They'd learned that simply boring holes in the sky doesn't make anyone a better pilot.

And do you know what happened? The fliers in this squadron took notice. They became proud of the idea of quality flight time. An aircrewman from the squadron actually called us up at *APPROACH* and told us about the CO who finally had the guts to pull his squadron off the merry-go-round and set real goals for his fliers instead of aiming for empty spaces in the record books.

In doing this, the skipper demonstrated what Hemingway called "grace under pressure," an eloquent definition for guts.

A lot of us feel pressure from time to time. I just wish more of us — like this CO — had the grace to go with it.

LT Colin Sargent

approach

An aft lookout is silhouetted as flight deck operations thunder overhead the USS CARL VINSON. Photo by PH3 Todd McClaskey, CVN-70.

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In the January '83 *APPROACH* on page 1, the Volume No. was incorrectly identified as Vol. 28 No. 6. The correct identification is Vol. 28 No. 7.

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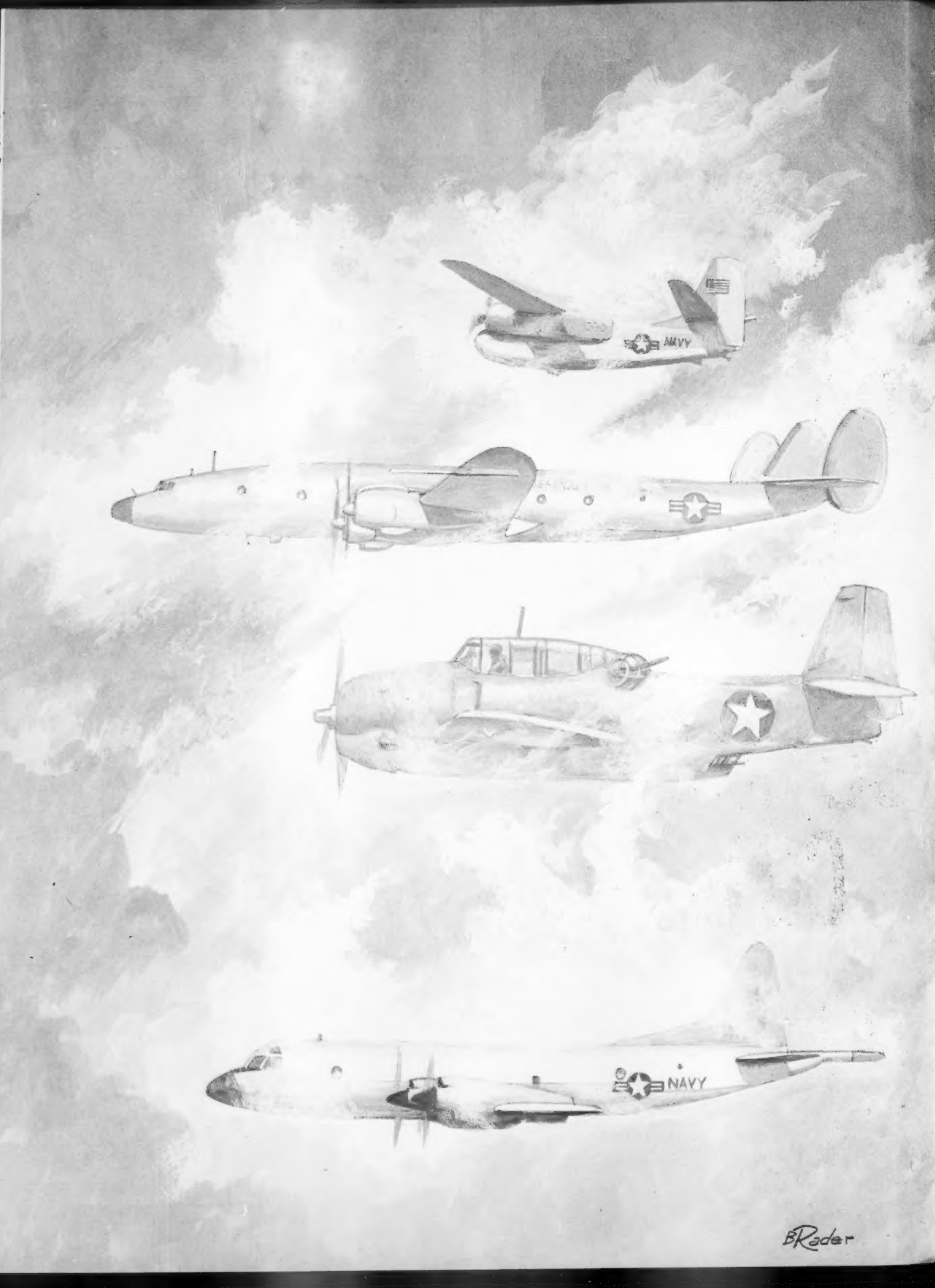
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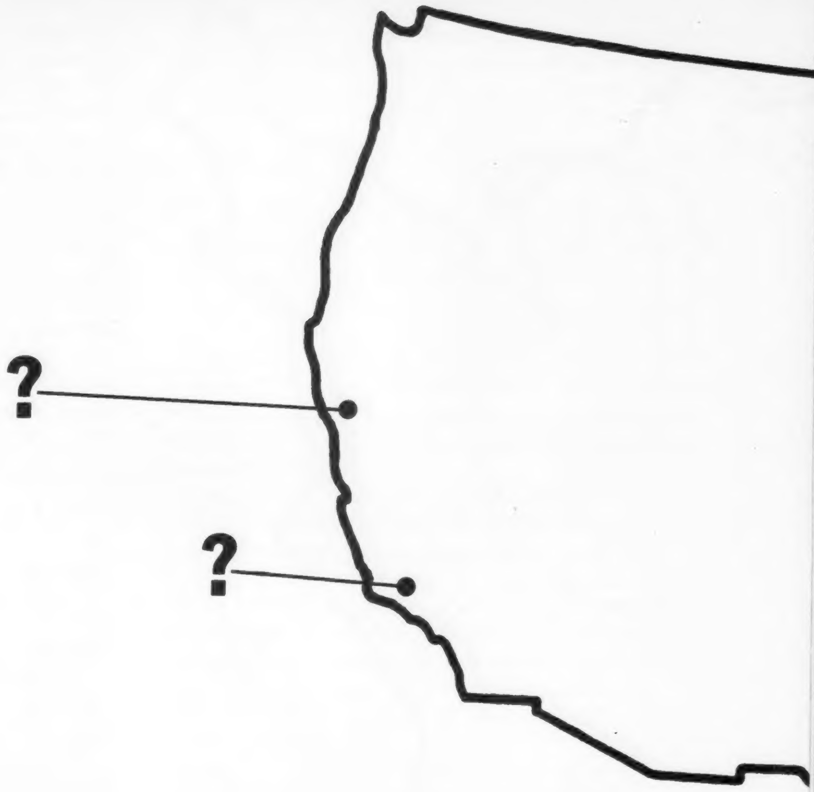
An aircraft takes off on an overwater flight and slowly goes IMC. The hop continues as planned until mysteriously, 2 hours later, all position reports stop. A massive SAR effort begins, and the hours stretch into years. No trace of the aircraft or its crew is ever found . . . What can mishap boards do when no physical evidence is recovered and they're forced to base their conclusions on



Not even a good guess

By R. A. Eldridge
APPROACH Writer

THE most tragic mishaps in naval aviation are those in which aircraft vanish after their last transmissions, leaving no witnesses, survivors, or bits of debris to recover. These catastrophes are the most frustrating of all to mishap boards, for the mishap cause often remains **undetermined.** Although we can speculate about possible causes, without a *corpus delicti* or wreckage to examine, our investigations, like the aircraft themselves, can only disappear into a series of ellipsis dots.

Probably the most famous disappearance in naval aviation is the story of the TBM torpedo bombers lost on 5 December 1945 during a flight from NAS Fort Lauderdale, Florida.

It began as a navigational triangle that included low-level bombing practice on shoals 56 miles due east of Fort Lauderdale. After the shoals, the first leg extended another 67 miles into the Atlantic, then shifted to the northwest for 73 miles before completing the triangle by returning home on a 241-degree course for 120 miles. This canned roundrobin had been flown thousands of times by pilots in operational flight training, always in the company of an experienced instructor. (This writer had flown the same flight about a year and a half earlier.)

For unknown reasons, the flight began to doubt their position and transmitted numerous radio requests for help in establishing their exact location. The leader then stated that both of his compasses were out. Hearing the *Avenger* pilots discussing their problem, an airborne instructor offered suggestions for orienting the flight. In spite of this, due to confusion, difficulties in transmitting and receiving, and general indecision on the part of the leader, no positive position for the flight could be established. No radio stations were able to obtain a direction-finding fix nor was the leader's emergency IFF picked up.

During the confusion of trying to establish their position, making several radical course changes, and milling about almost aimlessly, two of the student pilots were heard to transmit: "Damn it, if we would just fly west

2 hours after the flight had declared itself lost.)

At 1820, more than 4 hours after the flight had taken off, an airborne PBY heard garbled transmissions coming from the flight leader. "All planes close up tight . . . We'll have to ditch unless landfall . . . When the first plane drops to 10 gallons, we all go down together."

What happened after this transmission may never be known — at least no factual evidence has been discovered in the 38 years since the tragedy occurred. If indeed the fliers attempted to make controlled ditchings, the elements certainly weren't in their favor. It was dark, there were low ceilings and rain squalls, and the ditchings would have been made in a raging sea. Under these circumstances, it's questionable whether any of the crewmen could have survived the ditching. Even if there were survivors, they couldn't have lasted very long in the cold December

water, with the exposure index lowered by strong winds. To make matters worse, the unfortunate aviators were wearing only summer flight suits (exposure suits had yet to make their appearance).

This catastrophe is truly one of naval aviation's epic mysteries — 14 men were literally swallowed into oblivion. The report was summed up in one terse statement: "We're not able to even make a good guess as to what happened."

Unbelievably, there was an adjunct to the loss of the TBM flight. During the SAR effort to locate the *Avengers*, a PBM-5 seaplane with a crew of 13 was launched the same night from Banana River. At 1930 on the fateful night, the PBM radioed an "out" report to its home base and was never heard from again.

The only semi-hard evidence connected with this disappearance was a ship's report of seeing a flaming aircraft crash into the water. The sighting coincided with the exact time and location that the PBM disappeared from a search radar screen. No wreckage of this crash was ever found.

At 2139 on 30 October 1954, an R7V-1 (designated C-121 today) took off from NAS Patuxent River, Maryland on a passenger flight to Lajes in the Azores. The intended flight path was via the great circle route to the Azores. There were 42 people onboard the modified *Super Constellation,* mostly dependents traveling to Port Lyautey, Morocco, the ultimate destination.

A position report from the R-7V was received by the squadron's base radio at 2303. No further report was ever received. Search and rescue proceedings were initiated at 0815 on 31 October. Despite a mammoth naval air-sea search lasting for days, no single scrap of evidence presented itself.

Based on the known capabilities of the crew (the pilot in command had over 5,000 hours with more than 700 in type), the radio equipment available to the crew, and the

we'd get home. Head west, damn it!" Finally, in desperation, the leader did head west and transmitted, "We'll fly 270 degrees until we hit the beach or run out of gas." Once again, however, the leader vacillated in his decision and was heard to transmit to his flight: "Holding 270 degrees . . . We didn't go far enough east . . . Turn around again . . . We may just as well turn around and go east again." (It is believed that the leader was still of the opinion that the flight for some inexplicable reason was over the Gulf of Mexico. The students believed the flight was over the Atlantic Ocean, where it should have been.)

By 1750, the HF/DF nets had completed triangulation of bearings from six different radio stations. From this information, it was determined that the flight was within a 100-mile radius of a latitude and longitude north of the Bahamas and east of the Florida coast. "Unfortunately, no one thought to advise the activities assisting in the attempted recovery of the lost flight to make open or 'blind' transmissions of the 1750 evaluated fix." (This was

absence of distress signals, it was assumed that the accident occurred without warning, was violent in nature, and was beyond human capability to cope with. The most probable causes discussed included a flash fire, violent explosion, or structural failure. Despite a thorough treatment of these possiblities, there was no choice but to declare the cause undetermined.

Of interest in the investigation of this tragedy were some conclusions taken from the "Final Report on Accelerated Service Trials Model R7V-1 Aircraft." The report was dated 12 April 1954 — 6½ months prior to the aircraft's disappearance. The service trials were performed by the squadron that operated the ill-fated aircraft.

The report stated in part: "From the results of the service trials conducted on the R7V-1 aircraft, it is concluded that

- The R7V-1 is unsatisfactory but acceptable for service use.
- The R3350-34 engine as installed in the R7V-1 aircraft requires excessive maintenance.
- The discrepancies noted in this report are excessive, undesirable, and in some instances render the aircraft marginal from a safety standpoint."

In retrospect, it's entirely possible that one or more of these discrepancies did indeed render the aircraft unsafe.

On 26 May 1972, a P-3A took off at 0919 from a West Coast air station on a training flight with a crew of eight. At 0943, a transmission cancelling the P-3's IFR flight plan was received by an ATC center. This was the *Orion's* last radio contact. Five hours after the P-3's takeoff, the squadron was notified that it was overdue.

A thorough ramp check of all air stations within the area produced negative results. An all-inclusive air search by Navy, Army, Air Force, Coast Guard, and CAP forces was unsuccessful. No evidence of any kind was ever found.

The aircraft was not equipped with an inflight recorder or a CPI (crash position indicator), and recommendations by the mishap board emphasized that these two items were needed to aid in such catastrophes where absolutely nothing is known of the crash. The bottom line for this accident was "probable catastrophic failure due to unknown causes."

A carrier-based C-1A was on a local training flight in a warning area. The aircraft departed the warning area en route to an air station, where the crew had planned to make practice instrument approaches. The copilot reported to Center that they were transiting the warning area at 5,500 feet. At 1122, the copilot rogered a transmission for a vector to the IP (initial point) for an approach to the NAS. This was the last transmission from the C-1. The crew failed to respond to further transmissions requesting their whereabouts. The last radar blip from their IFF was received at 1129.

Based on radar indications of a rapid descent and disappearance from the scope, it is believed that the aircraft suffered a catastrophic failure of unknown origin. A thorough search of the area produced a very small amount of wreckage. It was enough to determine that extremely high G forces resulted from an uncontrolled impact with the water.

Although both pilots were capable and competent in the aircraft, nothing was evident other than an undetermined cause and four missing bodies.

Fortunately, the instances where an aircraft disappears literally from the face of the earth are rare. Even when this occurs, the possibility exists that the mystery may still be solved 5, 10, or even 20 years after the mishap occurs. Periodically some long-forgotten wreck is discovered on a mountain, desert, in a mud flat, or even dug up by some sea-going trawler.

Probably the most famous instance of this occurred in May 1959, when a World War II B-24 *Liberator* was found in the Libyan desert. It was discovered 16 years after it had been written off following a 1943 bombing raid on Naples, Italy. It was speculated that the aircraft and crew had been lost over the Mediterranean Sea while returning from the raid. (Aviation historical buffs who enjoy such sagas can read the entire story in the book LADY BE GOOD by Dennis E. McClendon, published by Aero Publishers, Inc.)

Aircraft mishaps, particularly those involving fatalities, are tragic, useless, expensive, and often end in a big question mark. If there is one positive aspect we can glean from mishaps, it is the determination of cause factors leading to the mishap.

In the last 30 years, the quality of aircraft mishap investigations has improved tremendously. We now have school-trained safety officers in nearly every squadron who can add their expertise to investigations. Mishap boards that have the opportunity to examine the wreckage do an excellent job of determining cause factors. In approximately 87 percent of all Class A mishaps in the last 5 years, specific cause factors have been determined. Thus, mishaps resulting from known causes can be given wide dissemination, hopefully to prevent similar mishaps. In many cases, mishap investigations uncover a need for an engineering change proposal, a new or improved part, a change to NATOPS, or any number of specific recommendations to higher authority, all of which are intended to produce the end result of mishap prevention.

It's only when we are confronted with mishaps such as those briefed in this article that there is a feeling of total frustration. You can't pull answers out of thin air! When the mishap board has no debris to work with, no survivors to interview, and no witnesses to the event, the questions of how and why must remain unanswered. ◄

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Three on One Is No Fun. A CH-46D was conducting night VERTREP training at NAS East Heliport. At the same time, a flight of three Army H-6 helos was approaching NAS East to conduct night training at the Heliport. Upon reaching "Point X-Ray" (located on the NAS East TACAN 018 radial at 2.1 nm.), the H-6 flight leader called for clearance and was told to switch to 284.4 MHZ by NAS East Tower. Two of the Army aircraft switched to 284.4, but the third switched to 237.8 MHZ, a prebriefed frequency for Heliport Tower. The H-6 flight leader then checked in with Heliport Tower, unaware that he was no longer able to communicate with one member of his flight.

The flight continued inbound to the heliport after receiving a "standby" in response to their request to enter the pattern. All aircraft reported sighting the other aircraft position lights at an estimated distance of one-half mile, but the potential for a midair collision was not realized until the aircraft were within approximately 250 feet of each other. Both the CH-46 and the flight of Army aircraft maneuvered sharply to avoid collision. It was estimated that the aircraft passed within 60 feet horizontally and 50 feet vertically of each other. Evasive maneuvering consisted of a rapid descent to 40 feet AGL followed by a hard left (45 degree AOB) turn by the H-46, and a rapid descent and left turn by the flight of H-6s.

This near-midair led to the following corrective action by NAS East:

The heliport's course rules were reviewed and the nonstandard "Point X-Ray" entry to the heliport is no longer permitted during hours of darkness.

A revised training program for the heliport traffic controllers has been implemented to further emphasize aircraft separation and adherence to course rules.

More comprehensive briefing procedures were effected to ensure the coordination of all heliport users.

The CO had this to say: "This near-miss was entirely preventable, yet progressed to the point of placing four aircrews in *extremis*. Aviation will always be a heads-up business in which aircrews must exercise their best lookout technique and good judgment to avoid tragedies similar to the one that almost occurred here."

This near-midair collision should alert all aircraft operators and air stations to take a good look at the effectiveness of their operating and briefing procedures. Visiting aircraft and aircraft operated by other services intensifies the need for explicit briefing and thorough coordination.

Talk About a Breakdown. An A-7 was about to launch from a CV. During its last flight, it had returned to the carrier with a PC-2 hydraulic failure. Because of the hydraulic failure, the flap handle had been placed in the ISO utility position for landing. It remained in this position with the flaps down during the subsequent manup and start for the current launch. **(The pilot failed to reposition the flap handle to correspond to the position of the leading edge flaps as required by NATOPS in the start checklist.)**

Since the current launch was nearly complete and the recovery was ready to begin, flight deck personnel determined that the A-7 would have to be broken down and taxied forward of the island to complete poststart checks. Within one minute after start, the pilot and plane director communicated via hand signals, lip movements, and head nods concerning the repositioning of the aircraft. The result of the "conversation" was that the pilot told the director to wait because he wasn't ready to move.

The ensuing few minutes were characterized by confusion and contradictory statements by the pilot and director. The squadron maintenance chief climbed up the boarding ladder and talked with the pilot concerning the need to taxi forward. After the chief climbed down from the aircraft, the director claimed he received acknowledgement from the pilot for his breakdown signal. The pilot claimed he never noticed the director from their initial "conversation" until he looked up from the cockpit and observed the director giving a "come-ahead" taxi signal.

By this time, and without the pilot's knowledge, the A-7 had been broken down and the chocks had been removed. Idle power coupled with a slight port list were enough to start the aircraft rolling forward.

Because the accumulators had been dumped and the flap handle was still in the ISO utility position, all three brake systems and nose gear steering were inoperative. As the A-7 started to roll forward, the pilot tried all brake systems, to no avail. He then dropped his hook, indicating brake failure. The aircraft continued forward until it hit a KA-6

parked just to the left and off the elevator, outboard of the foul line. Fortunately, minimal damage was sustained by both aircraft.

The A-7 skipper made these observations concerning this incident: "The late engine start caused by the just-completed maintenance action rushed the pilot and resulted in the flap handle being in the incorrect position in violation of A-7 NATOPS. Page 4-3, Paragraph 423 in the CV NATOPS states, 'WARNING: Aircraft shall not be taxied until pretaxi checks and required procedures . . . have been completed.' Because of the impending recovery, this warning was overlooked. Due to the confusion in communications, the yellow shirt broke down the aircraft without the pilot's knowledge. Two NATOPS violations and a breakdown in communications led to this incident. Lots of potential for disaster is associated with shortcuts, and this can't be tolerated. Aircraft and CV NATOPS must be strictly adhered to."

We'll buy that, Skipper.

CAMPing and FRYEing. Having just completed his postmaintenance functional checkflight, LCDR P. S. Camp passed control of the SH-3G to his copilot, LTJG C. R. Frye. At 800 feet over the coastline west of Subic Bay, LTJG Frye was beginning a level deceleration from 100 to 80 KIAS when a loud whine developed in the transmission area. The PIC took control of the helicopter and immediately turned toward the beach. In seconds, the loud whine ended with a bone-jarring bang and the ROTOR BRAKE caution light illuminated. Power was lost from the No. 1 engine, and LTJG Frye initiated single-engine procedures while LCDR Camp set up a single-engine landing.

Passing 400 feet, the No. 1 fire warning light illuminated, prompting the PIC to transmit a quick Mayday. Meanwhile, the crew, AMH2 James D. Peek and AMH2 Ian K. Spencer, confirmed the fire and quickly prepared for landing. Flaring the H-3 to eliminate ground speed, LCDR Camp noticed the MAIN GEARBOX chip light illuminate as LTJG Frye initiated engine-fire-in-flight procedures. The aircraft settled from 10 feet into soft sand about 50 yards from the ocean's edge. Emergency shutdown was anything but routine as both the manual and automatic rotor brake failed to operate. When the rotor system finally stopped, AMH2 Spencer extinguished the fire in the forward transmission area with the helicopter's portable fire extinguisher.

The superb airmanship of the pilot and the composure and coordination of the crew in the face of a catastrophic main gearbox failure is truly commendable. Along with the "well done" extended by COMNAVAIRPAC to this crew in its "Pro-of-the-Week" Award, we offer our Attaboy. Good show.

A Buzzing and a Grinding. Following a routine launch from USS INDEPENDENCE (CV 62), an F-14A flown by LT Gregory S. "Hollywood" Dishart and his RIO, LT Drahomir "Laser" Lazar, proceeded toward the CAP station. Twenty minutes after launch, in level 1-G flight, the VF-32 crew heard a buzzing and grinding sound. LT Dishart scanned the instruments and noticed the starboard engine oil pressure fluctuating. A moment later, the starboard oil pressure dropped and an associated oil pressure light illuminated.

As the oil pressure fell through 25 psi, the pilot secured the starboard engine and the RIO broke out the NATOPS pocket checklist. At this point, a severe airframe vibration began and continued until arrestment aboard CV 62. A visual inspection by another *Tomcat* flying wing revealed fluid streaming from the exhaust nozzle and a faint orange glow in the burner section of the starboard engine. Additionally, the starboard rudder and engine exhaust nozzle were vibrating visibly.

Since no other indication of fire was present, the aircrew presumed residual fuel was burning in the still-hot turbine section, so the emergency fuel shutoff was pulled as a precaution. To aid in engine preservation, the F-14 was slowed to 190 knots to reduce RPM to near zero. The flight turned inbound, the tower was notified, and a squadron representative was informed of the problem. While inbound, the crew thoroughly reviewed the procedures for single-engine landing, emergency hook extension, and single-engine bolter. The pilot then made a precautionary single-engine approach with a heavy right wing to an OK-4 wire. The postflight inspection revealed a bearing seal failure and massive turbine damage.

The alertness, coolness, and exceptional aeronautical skills displayed by LT Dishart and LT Lazar in handling this emergency saved a valuable *Tomcat* and are worthy of a hearty Attaboy.

Interior noise levels in the P-3C

By LTJG R. L. Coburn
VP-11

ONE of the most overlooked hazards associated with aviation is that of excessive noise. This is because the cumulative effects of exposure to high sound intensities are often not detected until *after* permanent damage to the ear has occurred.

The P-3C NATOPS Manual treats the high noise areas around the aircraft as **danger areas** and relates the number of safe exposure hours to various levels of noise as measured in decibels (dB). NATOPS also depicts the external noise levels we can expect during APU operations or engine turns. The subject of high noise levels *inside* the aircraft is not dealt with in NATOPS, however, and the task of disseminating information on these noise hazards and methods of combating them falls to individual squadron safety programs. To this end, a study of noise exposure to P-3C aircrews during operational missions was conducted by base medical personnel and our safety department during a recent squadron deployment.

The idea was to determine the magnitude of noise exposure to aircrews so that we could make recommendations regarding the possible hazards involved. The aircraft used for the study was a squadron P-3C Update II. The sound level meter was a *General Radio* (model 1565-B), which was calibrated in accordance with accepted procedures.

Decibel levels at the various crew positions, ditching stations and common areas of the aircraft were monitored and recorded during initial climbout and cruise portions of flight (labeled *high power* and *low power*, respectively). At low power, four areas tested were considered hazardous (above 84 dB) and capable of causing temporary or permanent hearing loss with prolonged or repeated exposure. These were the TACCO and ORDNANCE positions and ditching stations 11/12 and 13/14. At high power, six areas tested were considered hazardous: the TACCO, SS3, and IFT positions, and ditching stations 11/12, 13/14, and 15. While safe time of exposure limits aren't presented in NATOPS for noise levels below 90dB, it's widely accepted that noise levels above 84dB are capable of producing hearing loss. Additionally, the maximum safe time of exposure at 90dB is 8 hours according to NATOPS, and this value can easily be exceeded with common mission lengths of 9 hours or more.

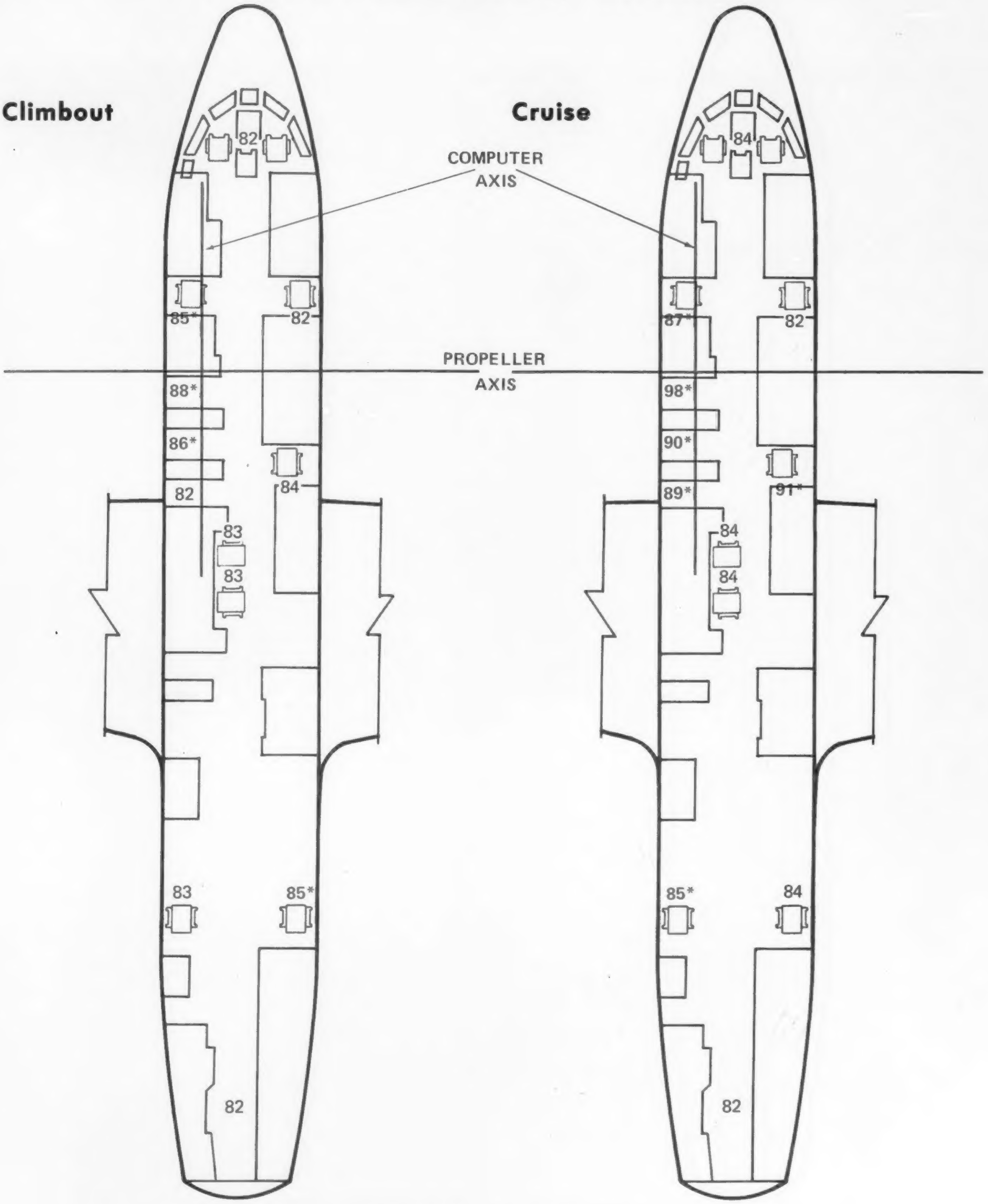
The following observations resulted from analysis of the noise level data collected in this study. First, and as expected, the highest noise levels in the aircraft were found at stations in the plane of the propellers. Noise levels generally decreased with increasing distance from this plane. Next, noise levels on the port side of the aircraft were generally higher than those on the starboard side. This may result from the location of the CP-901 computer and its peripheral equipment on the port side of the aircraft.

Think of these two noise sources as *sound axes*. The primary axis in the propeller plane accounts for the high noise levels in the forward fuselage area. The secondary or computer axis accounts for the higher noise levels on the port side of the aircraft. The location of the intersection of these two axes, in the general area of ditching station 11/12, is confirmed by the high dB readings recorded at both climbout and cruise which, at 88 and 98dB respectively, were the highest obtained. Finally, all noise level readings taken in this study were at or above 82dB and were therefore close enough to the 85dB threshold discussed previously to warrant caution, particularly on longer missions.

In view of these findings, I recommend that consideration be given to the wearing of earmuffs or plugs during all flight evolutions at all P-3C aircrew and ditching stations, particularly those where the highest noise levels exist. While the wearing of such protective devices may be considered an inconvenience by some, the prospect of permanent hearing loss brought on by repeated exposure to high noise levels is too high a price to pay for short term comfort.

VP-11 is submitting a NATOPS change recommendation reflecting this data. — Ed.

P-3C Noise Levels (in decibels)



(*) DENOTES NOISE HAZARD AREA

APPROACH diagram by Frank L. Smith

ENS Smith (left), LT Coyle (center), and LT Payne (right)

LT Robert Coyle
LT Doug Payne
ENS John Smith

VT-23

"B301, it appears you've lost your nose gear!" This was the call LT Robert Coyle, IP, and ENS John Smith, SNA, received from the NAS Kingsville control tower following a straight-in approach to a touch-and-go landing. Immediately following the touch and go, RPM on the T-2C's No. 2 engine decayed to 60 to 70 percent. The EGT was rapidly rising above limits. Taking control of the aircraft, the IP began a shallow dive, accelerating to 125 KIAS (airspeed required to raise the flaps to one-half). Meanwhile, ENS Smith secured the No. 2 engine to prevent further damage. They commenced a single-engine climb to the Delta pattern, where they were soon joined by another aircraft whose pilot reported that not only the nose tire but the entire nosewheel assembly had separated from the aircraft.

LT Coyle switched to base frequency and notified the VT-23 flight duty officer of the situation. LT Doug Payne, squadron LSO, was transported to Runway 17R (an off-duty runway), where the arresting gear was being derigged. Once on station, LT Payne contacted B301 and relayed the plan of attack: a low, flat, single-engine approach with a flare just prior to touchdown, followed by aerodynamic braking, holding the nose off the deck as long as possible. LT Coyle executed a picture-perfect approach from the rear seat, responding promptly to every call from the LSO. The aircraft touched down abeam the Fresnel lens at approximately 95 KIAS. The stub nose strut was held off the runway for approximately 3,000 feet while ENS Smith secured the No. 1 engine to preclude FOD. At approximately 60 KIAS, LT Coyle gently lowered the nose to the runway and the aircraft skidded another 1,500 feet before coming to rest on the centerline.

This was indeed an exhibition of extreme coolness and skill under conditions of constantly-increasing stress and pressure — a demonstration of aviation teamwork at its finest. LT Coyle, LT Payne, and ENS Smith are to be commended for their polished approach to this difficult situation.

BRAVO ZULU

Capt Brian T. Fenlon
1st Lt Marc T. Richardson
HMA-169

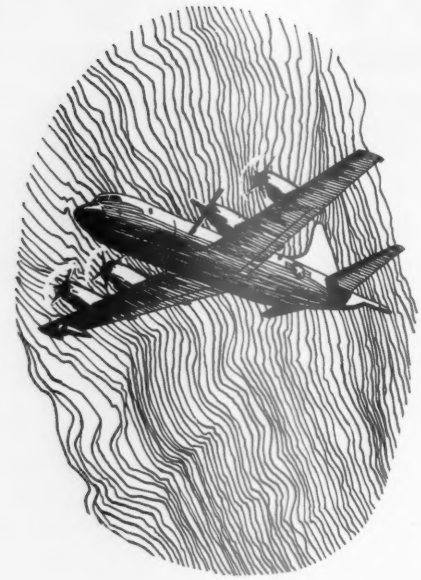
IMMEDIATELY following a simulated air-to-air engagement with an aggressor helo, Capt Brian Fenlon, flying an AH-1T, rejoined the transport helo flight he was escorting. He noticed a slight left yaw and heard the low RPM warning horn. Promptly lowering the collective to regain rotor RPM, he adjusted his nose attitude to obtain flyaway airspeed. His copilot, 1st Lt Marc Richardson, saw the gas producer falling below its self-sustaining limit and beeped the remaining engine. He confirmed that they'd lost an engine and continued to call the gauges and warn Capt Fenlon of obstructions in the immediate vicinity.

At the time of the engine failure they were proceeding through a narrow canyon. It was impossible to reverse course without risking a midair collision with a trailing CH-53 that was full of troops. Boxed in by a 200-foot wall of rocks on three sides, Capt Fenlon elected to climb the *Cobra* straight ahead to clear the rising terrain with as much power as he could gain from the remaining engine.

With 1st Lt Richardson constantly monitoring the instruments, Capt Fenlon was able to maintain his scan outside the aircraft to judge terrain clearance and select a suitable landing site. Several deliberate overtemps were made to the remaining engine in order to maintain rotor RPM. This may have made the difference as the aircraft cleared the final ridgeline by just a few feet. Moments later, a flawless slide-on landing was completed on the desert floor.

This aircrew's thorough knowledge of NATOPS emergency procedures, as well as exceptional crew coordination and judgment, averted almost certain fatalities and the destruction of a valuable aircraft.

Capt Fenlon (left), 1st Lt Richardson (right)



What you see is not always what you get

By Dr. R. A. Alkov
Naval Safety Center
(With the cooperation of Dr. Stanley Roscoe,
New Mexico State University)

• The pilot eased back on the yoke to flare his cargo aircraft a few feet above the short runway. Seeing that he'd overshoot his aimpoint, he attempted to go around but couldn't get spooled up in time. The aircraft went through a fence, across a ditch and broke up in a fireball as it hit a stand of trees. The ensuing fire killed the entire crew. The cockpit voice recorder revealed that just before landing, the pilot and his crew were in extreme pain from earblocks. There had been an abnormal increase in cabin pressure brought about by a problem with the air compressor during a rapid descent from altitude. . .

• Rolling in on a target on the desert floor, an attack pilot launched his missiles and started his pullout — too low. Realizing he'd misjudged his terrain clearance, he started a hard pullup but impacted the ground before the aircraft could fully respond. There was no ejection attempt. The weather was clear with no significant impairment to visibility.

• On an overwater approach on a clear night toward a brightly-lighted coastal runway with a city rising in the background, a patrol pilot reduced power, dropped too low too soon, suddenly saw he was undershooting, added power, but still touched down in the bay short of the runway threshold. He had excellent vision. In fact, his resting focus was at a greater distance than normal.

• During a sunny CAVU day over the Gulf of Mexico, two training aircraft collided. Neither the instructors nor the students involved saw the other aircraft in time to avoid the midair collision. One crew had time to eject successfully and was pulled out of the sea by a search and rescue helo. The other crew was killed instantly on impact.

WHAT happened in these tragic mishaps? Each of the responsible aviators was an experienced pilot, familiar with the flight environment. Each was regarded as a professional, skillful, calm, and with good judgment. Why, then, did they undershoot, overshoot, misjudge terrain clearance, or fail to see a midair collision developing? Why in a group of aviators with 20/20 vision or better do some spot "bogies" much sooner than others? Can such visual skill be acquired through training, or is it just something we're born with?

Research conducted by Dr. Stanley Roscoe of New Mexico State University and others, notably Dr. Robert Randle of the NASA-Ames Research Center and Dr. Herschel Leibowitz and his students at Penn State, has provided some answers to these questions. To understand the mechanisms involved, let's quickly review the physiology of visual accommodation — the focusing of the eye.

The lens of the eye is elastic and changes its curvature to focus at different distances under the control of the ciliary muscle (see Fig. 1). This is known as the accommodation of the lens. It was once believed that relaxation of the ciliary muscle caused the eye to focus at optical infinity. We now know it focuses at a relatively short distance when at rest,

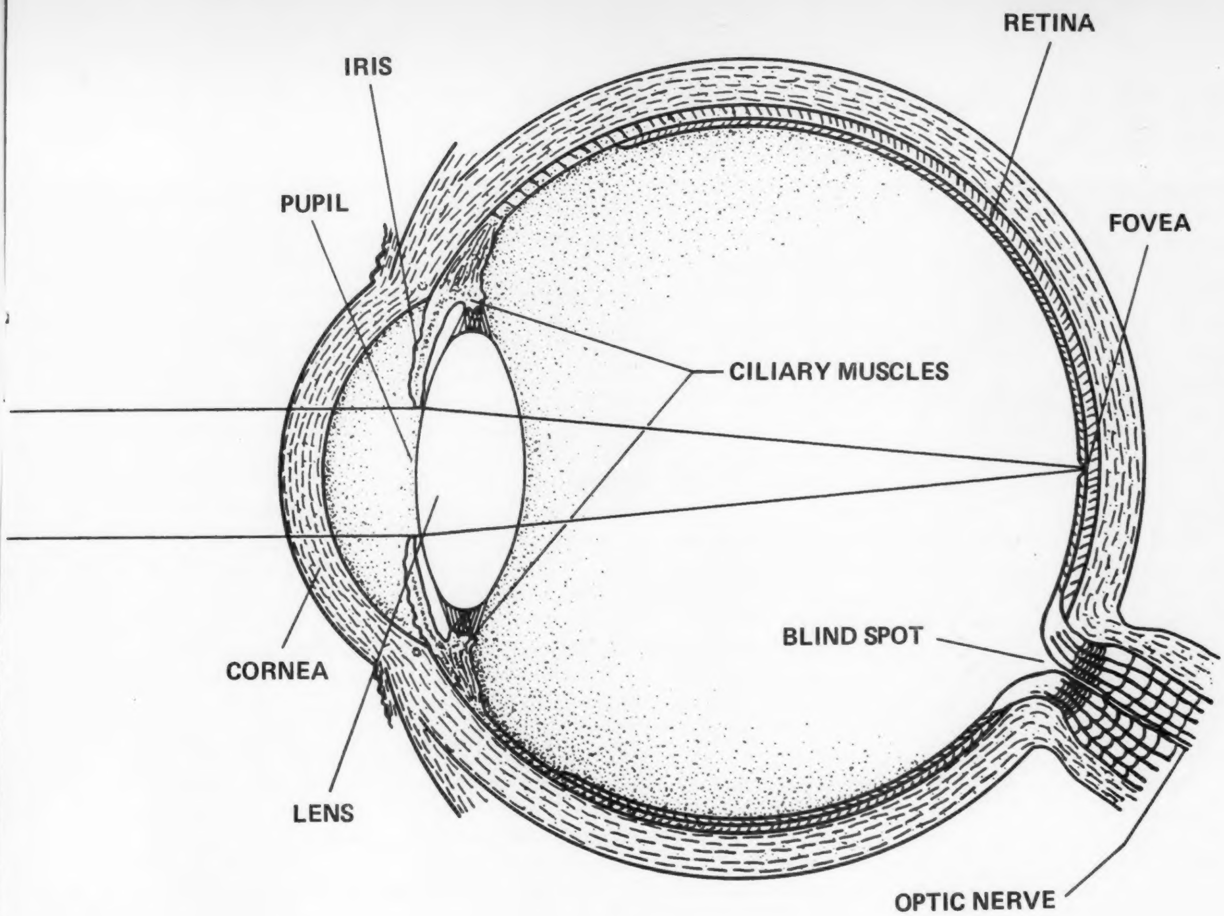


Fig. 1

although this resting distance varies greatly from person to person and moves outward as we get older.

The typical result for pilots in flight is *space myopia* (or nearsightedness) while flying under conditions where there's little or no texture to focus on outside of the aircraft's surfaces. Relatively "empty" visual fields occur when you're flying at night, at high altitudes, over water or snow, or during a hazy day. Also, clouds have surprisingly little effect as stimuli for distant focusing. Under such conditions, the eye relaxes and allows the lens to seek an intermediate curvature that requires no particular focusing effort. This relaxed state is known as the **dark focus**.

The eyes are constantly involved in a tug-of-war between focusing on some stimulus and returning to the dark focus, with the stimulus normally pulling just hard enough to be seen and recognized. Most of the time in flight, however, there's no stimulus out there to pull the eyes' focus away from the dark focus.

As previously stated, the dark focus varies considerably with the individual, even among those with normal vision. To find your own dark focus, try an experiment first described by Dr. J. Mandelbaum in 1960 (in a groundbreaking article for the "American Medical Association Archives of Ophthalmology") and since called the Mandelbaum effect. From the screened-in porch of his summer cottage, he found he couldn't read a sign on the beach when he stood a certain distance from the screen. All he could focus on was the mesh of the screen. When he moved closer or farther away or moved his head from side to side, he could again read the sign. The distance from his eye to the screen when he couldn't read the sign turned out to be his dark focus, a fact later confirmed experimentally by Dr. Fred Owens at Penn State.

Even if you do have "normal" vision, your dark focus can vary with the time of day, your emotional state, your workload, and your fatigue and stress levels. Furthermore, it has long been apparent that many naval aviators have much better than 20/20 vision, and there is a wide range of individual differences in perceptual abilities among those considered normal.

Empty-field myopia is reinforced by window posts and frames, some of which are quite close to the eyes. **Traffic**

appearing along a line of sight close to a window post may be virtually invisible to the aviator. There are two main reasons for this. First, the nearby structure can serve as a focus trap. Probably even more important is the normal scan habit of looking to one side of a post with both eyes and then to the other with both eyes.

The two fixations are typically about 30 degrees apart. As a consequence, traffic appearing near one edge of the post will be as much as 15 degrees off the line of sight. Only if targets move, flash, or glisten will they be picked up soon enough in peripheral vision. Even targets that present an extended distinctive shape, such as a long, thin contrail, can be missed when they appear close to a window post. Remember, an aircraft on a collision course stays on the same relative bearing and doesn't appear to move — it only seems to grow. . .

Research reported by Dr. Stanley Roscoe has revealed a high correlation between the size an object is judged to be and the distance at which the eyes are focused. When the eye is focused close-up, we judge the apparent size of a more distant object to be smaller than it really is, and the converse is true when the eye is focused farther away. Since the apparent size of an object serves as a cue to distance, it follows that the perception of depth and distance depends upon where the eyes are focused.

The apparent size of an object is therefore influenced by other objects near the line of sight that also affect focus. Dr. Roscoe believes that this accounts for the popular illusion that the moon seems larger and closer when it is near the horizon than it does when viewed overhead in an empty sky. He's shown experimentally that changes in the apparent size of the moon (or other objects) correlate almost perfectly with the distance at which the eye is focused. When we look at the moon above a horizon, our eyes focus at a great distance; when we look up at the moon in the sky overhead, our eyes relax to a near point close to the dark focus, and the moon appears to shrink accordingly.

If you want to see for yourself, try sticking your thumb out at arm's length and closing one eye. Look at a relatively distant object with your thumb held near the line of view of the open eye and then alternately open and close your other eye while still looking at your thumb and the object. Notice the apparent change in size of the object, shrinking when one eye is closed and expanding when it's opened. The reason for this is that the closed eye tends to return to its dark focus and to pull the open eye with it. The compromise between the two eyes is about halfway between the dark focus and the distance of the object being viewed.

What about the guy landing short at night? When flying over water toward a lighted runway on a dark night, pilots with distant dark focuses, looking at the lights of a runway on the shore with the lights of a city beyond, suffer from the illusion that the runway is larger and therefore closer than it really is, and the runway threshold consequently appears *lower* in the visual field. An aviator in this situation may take off power too soon and land short (see "The Last Run of Flight 915," *APPROACH*, April 1974). Dr. Roscoe recommends that lead-in light buoys be used where this problem exists.

As to the overshooting accident, researchers at NASA-Ames have shown that intense stimulation of the inner ears, such as that caused by a sudden increase in cabin pressurization, results in an overaccommodation of the eyes' focusing mechanism. This causes the runway to appear smaller and farther away than it really is (see "The Fallacy of Pilot Error," *AVIATION ACCIDENT INVESTIGATOR*, December 1982).

Outward accommodation is at least partially controlled by the sympathetic branch of the autonomic nervous system. That's the one that allows us to run faster and fight harder when we're "psyched up." It increases our visual acuity by magnifying what we see to allow us to detect enemies or sight elusive prey when our adrenaline is pumping. This mechanism has helped us since the days of the caveman. Can it be that today this same process causes the attack pilot's visual world to expand, making the ground appear lower and causing him to pull up too late?

It has been demonstrated that some people can be trained more easily than others to *control* the focal distance of their eyes. This ability is related to a person's dark focus and should be given consideration in the selection and training of aviators. A distant dark focus could be one basis for assigning a flier to fighter or attack aircraft. Individuals with a distant resting focus are not troubled as much by empty-field or space myopia.

Of course, as pilots gain more experience, they learn to compensate for biased distance judgments. As an individual ages, resting focus moves farther away so that target detection tends to improve. In extreme cases, however, a pilot who has "eagle eyes" may have serious problems in making a "black hole" approach at night and may be more likely to land in the water.

The key is detection. Now that we know that certain circumstances can alter our vision, we can take steps to voluntarily control our eyes' accommodation. There you have it; what you see is not always what you get, but you **can** learn ways to see more than you've ever seen before! ◄

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ANYMOUSE

Nuggets Can See, Too!

SITTING in the back seat of a TA-4, returning from a great cross-country, I was feeling pretty smug, this being my first FAM in this bird. The "front seater" was a super instructor with over 1500 hours in model, and we were coming around to practice a low precautionary approach on the duty runway. At the 180, I casually looked over and noticed three or four men with a vehicle on the left edge of the runway working on the arresting gear motor near the lens. As we turned downwind, I couldn't believe my eyes; there was a crane on the left side of the threshold! I assumed that the pilot saw it because he'd lined up slightly to the right of centerline. The next thing I knew, there was loud noise over the ICS as we touched down, veered around the crane, and became airborne again. The pilot, after his unprintable remarks were over, asked me if I saw that. I replied in the affirmative and asked if he had seen it too. He said not until almost too late; he had been busy setting up the emergency approach and hadn't noticed the crane at the runway edge.

Moral: Even though you are the newest nugget ever, your eyes are as important as any part on the aircraft. If you see something and have a question, or if there is any possible problem at all, **COMMUNICATE**.

Tower was notified immediately and an OP Hazard Report was filed along with this communication form.

Talkingmouse

Starved, Fatigued, Frustrated

ON a Sunday afternoon at a large air station, a crew chief was supervising moving a helicopter from the flight line to the hangar. From his position as right wingwalker, he noticed and was preoccupied by the open door on his side. While the aircraft was in motion, and despite a verbal warning from the tailwalker, he tried to slide the door forward. In doing so, he lost his balance and fell. The right wheel rolled over his right ankle, causing multiple fractures. He was rushed to a hospital for an emergency operation.

Upon investigation, it was found that his total food intake in the 4 days before the mishap was two sandwiches, two cokes and a six pack of beer. Ketones in the urine sample confirmed the biochemical state of short-term starvation.

Due to a high tempo of operations, he averaged 4 to 5 hours of sleep a night that week. In addition to these physiological stresses, he was intensely frustrated; his personal problems reached a peak with his failure of a NATOPS check 2 days prior to the mishap. One day earlier he lost a socket wrench in the transmission of the helo and stayed up most of the night in a futile search for it.

It is clear that the primary cause of the mishap was a judgment error, caused in part by the noted physical and psychological stress on the individual. In high tempo operations it is essential for supervisors to monitor their crew chiefs and mechanics as well as pilots to detect impairment due to fatigue, poor nutrition and personal stress. High tempo operations will always be with us. It is our responsibility to watch out for signs of decompensation in key individuals and withdraw them in time to prevent mishaps like this one.

Flightsurgeonmouse

P-3 NATOPS Violations

A visiting P-3 at a West Coast air station was waiting for a huffer to arrive for engine starts. Through the open forward aux escape hatch, the PPC was informed that there was a delay in the huffer's arrival. After it arrived, a crewmember was sitting with his entire upper body exposed through the hatch. Thus, when given the signal to start the No. 2 engine, I immediately gave the PPC the hold signal and requested that the hatch be closed and the crewman be ordered to get inside.

At this time, the No. 2 engine began turning with the crewman still hanging out the hatch. I immediately gave the pilot the "cut" signal three times, but to no avail. When the engine came to full RPM, the crewman was still exposed.

It seemed as if the cockpit crew didn't care about the safety factor involved.

VP linemanmouse

This evolution had three separate NATOPS violations: (1) the door hatch wasn't closed prior to engine start, (2) the PPC elected to start without clearance from the lineman, and (3) the lineman's signals to cut engines were ignored by the PPC.

The crewman hanging out the hatch was also needlessly exposed to a hazardous situation, and a definite noise hazard was also present.

Immersion hypothermia and ditching

By Joe Casto
APPROACH Writer

Event: The water temperature is 42° F when your P-3 ditches into the open sea. Forty-knot winds, 15-foot waves, and freezing rain help sink the aircraft within 2 to 3 minutes. Your copilot's floor breaks up, the NAV table shatters, the TACCO's window implodes, and ditching station 17's seat collapses. A large crack appears in the deck near the ladder, and one crewman's foot gets caught during egress. The hydraulic service center cover comes off, and another crewman falls into it, making escape even more difficult. All emergency lighting fails, throwing you and the cabin into total darkness.

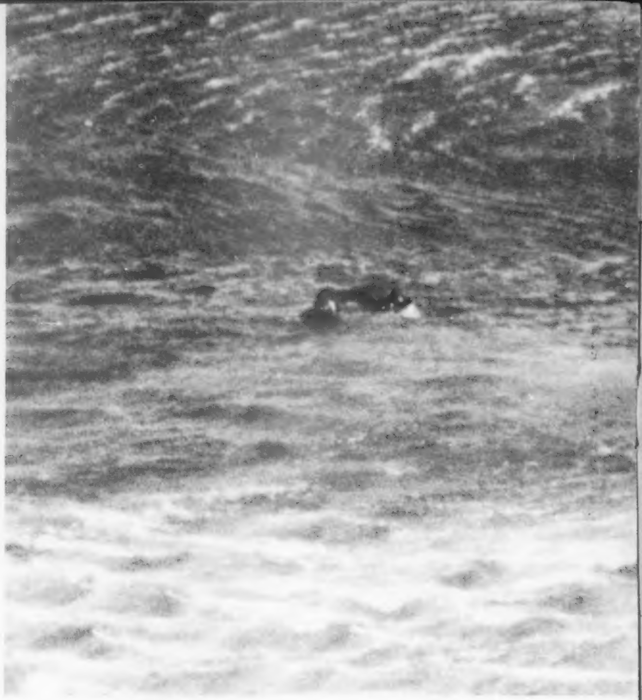
"You've all donned antiexposure suits, but several of you are wearing them improperly. Some suits have holes in them from age, while others have ripped during ditching and egress. You're at the mercy of the elements . . ."

Without light, straps and clips on survival gear are very hard to find. Your crew is unable to launch the port raft. The Mk-7 and one Mk-12 liferaft do get launched, but their tether lines break immediately. A pilot starts swimming to the drifting rafts and is impeded by his inflated LPA . . . He disappears beneath the waves.

You've all donned QD-1 antiexposure suits, but several of you are wearing them improperly. Some suits have holes in them from age, while others get ripped during ditching and egress.

Nine men enter the Mk-7 raft. There's no spray cover in the Mk-7, the raft will not stay fully inflated, and the bailing sponge is completely useless. You're at the mercy of the elements. One man leaves the Mk-7 raft and swims to the drifting Mk-12, where he joins three other fliers. The Mk-12's spray cover affords better protection than the open, partially-inflated Mk-7. One man dies after 3 hours in the raft, 2 more die after 11 hours.

Mk-13 flares, pen flares, and strobes flash into the sky. The pen flares are most effective. Another aircraft leads a fish factory ship 31 miles to the scene. The rescue is completed 12 hours after ditching. Five of your 15-man crew



have died from hypothermia or drowning.

Event: An A-6 pilot and you, the bombardier/navigator, eject during approach at 50 feet, 140 knots. The pilot lands in shallow water and is picked up by a helo that has been diverted to the scene. You land half a mile from shore in deep 40° F water and are unable to release your left Koch fitting due to very cold hands and the hindrance of your inflated LPA-1. Nearly paralyzed with cold, you're unable to locate your shroud cutter.

Next, the helo puts a swimmer in the water. Neither you nor the swimmer is wearing antiexposure gear. The swimmer can't release your remaining Koch fitting, loses his shroud cutter and borrows yours to free you. The helo's rescue hoist fails, so the helo hovers at water level while you both try to hang onto the helo's struts. Of course, your hands are too numb to retain a hold on the struts. Finally, the helo lowers a rescue sling and drags you ashore, one at a time. The rescue is completed 40 minutes after ejection. . .

Survivors of ditchings in cold seawater frequently suffer from hypothermia. Two questions immediately arise: What temperature is "cold," and just exactly what is hypothermia?

Immersed in 92° F water, your body's heat production can barely keep pace with environmental heat loss. In other words, any water temperature less than 92° F will have a detrimental effect on your well-being and is considered cold. Interestingly, water at 80° F causes the same heat loss as air at 42° F.

Hypothermia is the rapid, progressive, mental and physical collapse that accompanies the chilling of your body's inner core. Below 92° F (water temperature), your body loses more heat than it can produce. Additionally, your physical condition and mental attitude, the way you're dressed, and your activity in the water will determine how long you can survive. Water at 50° F or lower is too cold for unprotected human beings to endure for long. Cold water drains heat from your body and destroys about 90 percent of the insulating quality of cloth.

What is core temperature? It's the temperature found in your central body cavity, where your vital organs are. This differs with the temperature found in your extremities, called peripheral temperature, because of the way your body adapts to external cold influences. By trying to maintain as normal a core temperature as possible, your circulation decreases toward your skin and extremities to conserve heat energy and prolong survival.

Cold air and cold water exposure are both life-threatening conditions, but cold water presents the greatest danger, because it conducts heat from the body 20 to 32 times faster than air. The immediate impulse most people have is to exercise and move about rather quickly in an attempt to keep warm. Unfortunately, this reaction tends to drain the body of its heat reserves at a much faster rate and decreases survival time.

The effects of hypothermia vary between individuals because those effects depend, at least partially, on body build, fat content, state of nutrition, physical condition and oxygen processing capacity. Below certain body-core temperatures, your body's heat regulation mechanisms break down. If your body temperature decreases faster than your regulatory mechanisms can keep pace, brain activity controlling heat regulation will fail and your body-core temperature will fall even further. At about 80° F core temperature, the heart's built-in pacemaker fails and death can occur due to cardiac fibrillation (uncontrolled, unsynchronized heartbeat).

Your body's metabolism produces heat as a by-product while converting food into useful materials and energy. Exercising, including shivering (one of the body's automatic defenses against cold) and short bursts of maximal muscle contractions, releases as much as 100 times the normal amount of expended heat. This rapidly depletes your body's available energy stores, invites exhaustion, eliminates heat-loss compensation, and results in severe hypothermia. There is only so much energy stored in your body.

The following chart is part of a hypothermia report by LCDR Donald C. Arthur, MC, USN, for the Naval Submarine Medical Research Laboratory. It depicts in detail how humans respond to decreasing levels of body-core temperature.

SIGNS OF HYPOTHERMIA AS RELATED TO CORE TEMPERATURE

°C	°F	
37.6	99.6	Normal Rectal Temperature
37	98.6	Normal Oral Temperature
36	96.8	Metabolic Rate Increases — trying to overcome heat losses
35	95.0	Shivering Maximum
34	93.2	Victim still conscious with normal blood pressure
33	91.4	Severe hypothermia below this level
32	89.6	Consciousness becomes clouded, pupils dilate but remain reactive to light, blood pressure becomes difficult to obtain
31	87.8	
30	86.0	Progressive loss of consciousness, muscular rigidity increased, pulse and blood pressure very difficult to obtain
29	85.2	
28	82.4	Ventricular fibrillation may develop if heart irritated, cardiac arrhythmias develop, atrial fibrillation occurs spontaneously
27	80.6	
26	78.8	Victim seldom conscious
25	77.0	Ventricular fibrillation may occur spontaneously
24	75.2	Pulmonary edema develops
23	73.4	
22	71.6	Maximum risk of ventricular fibrillation
21	69.8	
20	68.0	Cardiac standstill
19	66.2	
18	64.4	
17	62.6	Flat-line Electroencephalogram (EEG)
16	60.8	
15	59.0	Lowest accidental hypothermia victim to recover
9	48.2	Lowest artificially cooled hypothermia patient to recover

Dr. Andrew M. Longley, Jr., of Brunswick, Maine, has this to say about cold-water immersion survival time: "The survival time before death is determined by both the degree of water temperature and by the time exposed to the water. In 32° F water, survival is 1 to 2 hours; at 40° F, survival time is about 2 hours; at 50° F, survival time can stretch out to 3 hours; and at 60° F, survival can be from 4 to 5 hours. Of course, these are rough estimates, since there are many factors that will affect individual survival times."

These estimates include cold-induced unconsciousness (during which you may perish from other causes, like drowning) and assume clothing appropriate for the environment. Dr. Longley further states: "Individuals with large layers of adipose (fat) tissue or more layers of clothing, who float passively, improve their survival time. Increased activity diverts the circulation from the (body) core to the peripheral muscles where the heat is more rapidly dispersed into the environment instead of being preserved in the core."

Now that you have a rough idea of how long you can expect to survive in cold water, let's consider a few things you can control in order to extend that time.

• First, mental attitude is extremely important in any effort to conserve energy. A positive attitude will cause you to expend less energy than a negative attitude. An inexperienced person will waste energy due to anxiety, but the pro will husband that same energy and reserve it for the unexpected.

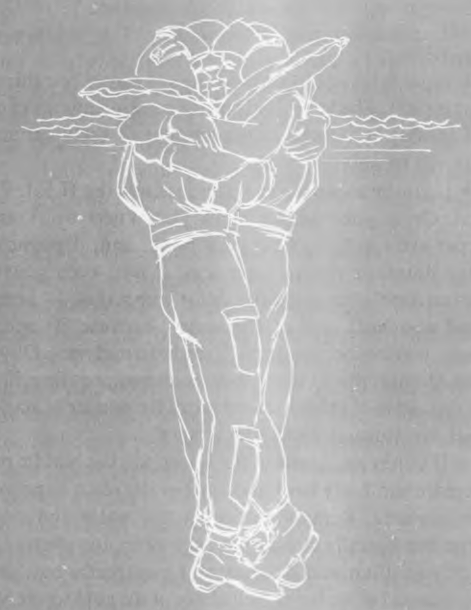
• Wear layers of loose clothing instead of one thick layer that is tight. The loose folds trap a certain amount of air and aid insulation. Decrease the amount of body surface area exposed to water.

• If you're alone in the water, assume the H.E.L.P. position. Cross your ankles, draw your knees up, keep your upper arms tight against your body, and, if possible, hug your flotation vest or your legs; if not, keep your hands tucked into your armpits. *Most* important — keep your head and neck out of the water, because 80 percent of body-heat loss occurs through the head and neck. Obviously, you should think twice before drownproofing if you're immersed in cold water (because of the danger of accelerated heat loss through head submersion).

• If you're not alone in the water, use the huddle position to maintain body heat and further decrease exposed body surface area. Remain vertical in the water and stay close together, literally clinging to each other for warmth.

If you ditch and do everything correctly but lose consciousness before being pulled out of the cold water, you still have a slim chance because of yet another of your body's automatic survival processes. This recently recognized phenomenon is known as the *mammalian diving response* and was first identified by Dr. M. J. Nemiroff, a pulmonary medicine specialist from the University of Michigan, and

The H.E.L.P. Position
(Heat Escape Lessening Position)



The Huddle Position

Dr. J. S. Hayward of the University of Vancouver, B. C. Their studies have demonstrated that the mammalian diving response is triggered involuntarily by immersing your face in cold water. Your body then slows its normal functions and permits only a minute amount of oxygen to be very slowly circulated between the lungs, heart, and brain (but not to the extremities or skin). Dr. Nemiroff has successfully revived 33 people who've "drowned" in 68° F (20° C) water and were submerged for an average of 10 minutes. (The longest recorded submersion was 38 minutes.) In each case, the "drowned" victim displayed typical death symptoms: no apparent heartbeat or pulse, blue-skin discoloration, no detectable breathing, and dilated pupils. Each "victim" involuntarily employed the diving reflex and was revived with no ill effects. Consider this mammalian-diving-response incident of 12 March, 1979 in Cambridge, Massachusetts:

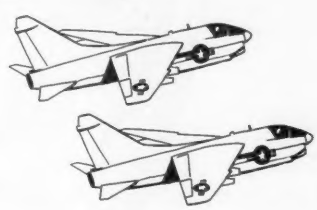
Libby Marcoulis-Pineo survived a 38-minute immersion on the bottom of the Charles River while ice floes drifted on the surface. Libby and a friend were driving home to Maine when their car careened off a bridge at 12:30 a.m. Her friend was removed from the car by a college campus guard who plunged into the icy waters and dove to the car twice before successfully opening one of the jammed doors of the submerged vehicle. The diver did not see Libby on the floor of the back seat because of the dark water. Twenty-eight minutes after the friend's body was retrieved, the car was hauled out of the river. When Libby was finally discovered someone ordered a body bag for her but another rescuer initiated resuscitation. Libby regained consciousness 1½ days later in a hospital. She was told that upon admittance her body temperature was 84° F and the electrocardiagram recorded a flat 9 E.E.G. She was restrained on a bed by straps, fed intravenously, and had a tube running down her throat. Libby had no memory of the accident and wondered if she had lost her sanity. She had a few scrapes and bruises from the accident and suffered some temporary brain damage which lasted approximately 6 months. Libby describes her recovery period mentality as being on the approximate level of a 10-year-old. Her friend did not survive the accident.

Virtually all water-related deaths are labeled "drownings." The truth is that several different processes are involved. They are:

- Wet drowning, where the victim inhales water into the lungs and dies.
- Dry drowning, where the victim has little or no water in the lungs but suffocates because his air passage becomes blocked.
- Shock-induced heart attack.
- Hypothermia.

Four minutes without oxygen is all your brain can endure without incurring permanent damage. The minute trickle of oxygen provided by the mammalian diving response avoids this condition and demands that resuscitation attempts be initiated immediately on any "drowning" victims and continued on the trip to the hospital, especially when immersion time isn't known.

Looking the other way doesn't pay



By Russ Forbush
APPROACH Writer

Failing to follow the written word has caused many a naval aviator to break his neck, his aircraft or both. What you are about to read is one more example of what can and does happen when aviators, individually or collectively, look the other way.

LET'S join up with a CV on its way home from deployment. Today, a VA and VF squadron are about to fly a dissimilar air combat training (DACT) hop. With the participants gathered for a face-to-face brief in the VF readyroom, the brief is conducted in accordance with squadron SOPs, CVW TACNOTES and higher directives. Later, the VA flight leader (mishap pilot) assembles his troops in the VA readyroom for a squadron brief. Another squadron pilot (assigned as mission tanker) attends this briefing as well.

The pilots man their aircraft at 1605. The lineup consists of three *Corsairs*: 201 (mishap aircraft), 207, and 213 (the tanker). The single F-14 in the flight is side number 110. Following normal start and poststart checks, the aircraft launch at 1706. At the time of launch, 201 is configured with a D-704 on Station 1, droptanks on Stations 6 and 8, and an AIM-9L on Station 4. In other words, the aircraft is tanker-configured.

By the way, the CVW TACNOTE and squadron SOP prohibit tanker-configured aircraft from participating in ACM, DCM and DACT . . .

Both 201 and 207 join overhead at 11,000 feet MSL and immediately check their respective aircraft. No discrepancies are noted. 207 then detaches for some dive bombing as previously briefed, and 201 continues outbound to meet the F-14 (110). During this time, 201 performs an "OK roll" aircraft flight control system (AFCS) cutout check. *Corsair* 201 then checks in with CV Control on button 4 and is switched to button 5.

At this point, 201 and 110 are ready for DACT but decide to run an air intercept due to heavy fuel weights. CV Control vectors 110 to a 180-degree heading in order to set up for an intercept on 201. The intercept training goes smoothly and is terminated by a fly-through.

The other two A-7s, 207 and 213, are hot to get into the DACT, and permission for them to do so is requested by the CV Controller. Both flight leaders concur but restrict 213 to a fly-through on the initial engagement since the pilot hasn't attended the DACT briefing. This decision is acknowledged by all parties. The A-7 flight leader is then vectored for a joinup with 207 and, shortly thereafter, 213, who has just completed dive-bombing training.

The engagement begins with 201 in the lead, 207 on the port side, and 213 on the starboard side. Both wingmen are in combat-spread formation. Initially the A-7 flight is set up on a heading of 270 degrees at 14,000 feet MSL. The F-14 is

"Once again, not going by the book cost us an aircraft."

then vectored 080 degrees for the intercept. Separation at the time is 45 miles.

After obtaining radar contact on the *Corsairs*, the F-14 offsets to the south so that he can hook around to the stern of his contact. Next, the A-7 flight descends to 11,000 feet MSL and accelerates to 425 KIAS. The F-14 then turns left to a heading of 020 degrees and gains visual contact with the A-7s at 8 nm. The *Corsairs* are in a combat-spread triad at 11,000 to 12,000 feet MSL and 400 KIAS. The F-14 begins an arcing left turn south of the flight and slightly high, maneuvering to an 8 o'clock position over the A-7s.

At 5 nm, the A-7 tanker pilot calls tally ho on the F-14 at the flight's 8 o'clock position, slightly high. This is quickly followed by tallies from 201 and 207 on the F-14. Then 213 banks to the right and exits the engagement to the north. The fuel load distribution in 201 is 2,000 pounds in the D-704, 1,000 pounds in each droptank and 9,000 pounds internal fuel. Droptank pressure is off. Commensurate with the initial tally on the *Tomcat*, 201 initiates an easy, slightly nosedown turn to the left while the F-14 is still in a noseup right turn. Both aircraft have about 20 degrees angle off.

During the next few minutes, several DACT engagements are conducted by the participants. 201, observing the F-14 in a hard-down, slicing turn, initiates a reversal to the right and starts a nose-high, 2-4G turn to set up a head-on AIM-9L shot. 201 is flying at 350 KIAS and 12,500 feet with the nose 10 degrees above the horizon. The F-14 continues in a nosedown port turn.

When the F-14 is head-on with approximately 10 degrees angle off, 201 increases his pitch rate and pulls the nose up an additional 10 to 15 degrees. At this time, 201 encounters airframe buffet. The mishap pilot relaxes the G-loading, but the nose yaws right and the A-7 departs controlled flight at 13,000 feet MSL, 325 KIAS, and 35,800 pounds. The departure is characterized by two heavily-wrapped-up, oscillating right turns.

After departure, 201 initiates standard NATOPS departure-recovery procedures for symmetrically-configured aircraft, repeatedly activating the AFCS disconnect paddle switch. At this point, the F-14 pilot queries, "A-7, are you okay?" to which 201 replies "No — I've got a departure." The *Tomcat* pilot comes back with "Okay — watch your altitude."

207 (the A-7 wingman) then transmits, "201, you're at 9,000 feet." 213 hears the altitude call and, sensing trouble, attempts to return to the area of engagement.

201 is now in a nose-low, non-oscillatory, erect spin to the right with AOA pegged at 30 units, turn needle to the right, and airspeed somewhere below 200 KIAS. The pilot attempts to recover from the spin by applying full right aileron, full left rudder, and neutral-to-slightly-forward stick. Still in a spin, the aircraft passes from 8,500 to 8,000 feet MSL and is observed by 207 and 213 to develop 4 to 5 incipient autorotative turns to the right. At 6,500 feet MSL, the A-7 is still in a fully-developed spin, prompting the pilot to initiate ejection with the upper ejection handle.

The F-14 pilot takes over the on-scene SAR commander's role, initiates a MAYDAY, and requests a SAR helo be dispatched to the area. Although some trouble is encountered locating and holding the downed A-7 pilot in sight, a successful rescue is effected and the mishap pilot is returned to the CV with only a cut hand to show for his ordeal.

There are both pilot and supervisory factors associated with this mishap and they are discussed below.

The Pilot. The mishap pilot failed to comply with squadron and air wing directives restricting tankers from participating in ACM. The squadron instruction further states that no assymetrical loading is authorized while participating in ACM/DCM. Prior to engagement, the pilot had positioned his fuel to conduct an expeditious fueling evolution with the F-14 after the engagement. Deliberately positioning the fuel into an assymetric load prior to an ACM engagement indicates that the pilot was not thinking correctly at the time the mishap occurred.

At initiation of the ACM engagement, the mishap A-7 was at 11,000 feet MSL, 35,900 pounds gross weight and 425 KIAS with a drag count of 95. Subsequent maneuvering placed the aircraft in an operating region near its aerodynamic limits. When the pilot reversed his aircraft to the right, with a corresponding 2-4G climbing turn, his energy level and G available decreased at a rapid rate. The pilot, although conscious of the A-7's airspeed and G-loading, did not realize the extent of dynamic energy loss and thought he was still far from an aircraft departure because he wasn't pulling very hard.

Aero 1-D droptanks and D-704 refueling stores are aerodynamically unstable stores. This fact, coupled with a left, 11,600-pound assymetrical load at the time of departure, made the aircraft prone to autorotative spin entry following a departure from controlled flight. Also, with partial fuel loading in the droptanks, fuel sloshing to the rear of the tanks while the A-7 was in a noseup attitude tended to decrease the static marginal stability of the aircraft, further enhancing the possibility of departure.

Supervisory Personnel. *During an earlier deployment, both squadron and air wing supervisory personnel began* **looking the other way** *regarding the restrictions placed on conducting ACM in tanker-configured A-7s.* This came about because bluewater operations required additional tanker aircraft to be airborne. This resulted in fewer A-7s available for ACM and made it more difficult to meet squadron readiness postures. Little by little, the use of tanker A-7s for ACM became "normal" operating procedure and continued until this mishap occurred.

Once again, not going by the book cost us an aircraft. The pity is that it was knowingly condoned at the squadron and air wing supervisory levels. While every effort should be made to get our aviators properly trained, such training must be accomplished in accordance with written instructions. It may take a little time, but eventually looking the other way will catch up with the guilty parties — and **this just doesn't pay.**

A flash of yellow flame

By Richard A. Eldridge
APPROACH Writer

"AS I was sitting in the crash truck, I was alerted to an aircraft rolling down the runway and watched it rotate and lift off. Suddenly there was a flash of yellow flame from the tailpipe. After noting the yellow flame, I realized it was a stagnating engine. The aircraft pitched up — not a normal rotation, but a sharp pitchup. Then it began to fall off on the left wing. I doubt if it ever reached an altitude of more than 25 feet."

An aviator died in this mishap, but he wouldn't have if he'd followed the rules. It could easily have been a Class B with nothing more serious than a FODed engine. Instead, it was a fatality, with all the attendant remorse of loved ones and squadron shipmates. He died because he didn't consider the possible consequences of a night on the town before he was challenged to meet an unexpected emergency on takeoff the next morning.

His intelligence and judgment were not questioned by his peers and superiors, although they should have been alerted when he headed for town late at night. No one thought to suggest to him that a better idea would be to retire since he had to fly in the morning. It was clearly a case of the "I'm-not-my-brother's-keeper" syndrome.

Several months earlier, the CO of a sister squadron had kept a nightly vigil at a favorite watering hole to note if any of his officers were violating the "12-hour-from-bottle-to-throttle" rule. The officers, especially those who attempted to avoid detection, failed to appreciate his concern. Even the CO of the squadron that suffered the fatal mishap above didn't understand the other CO's policy at the time it was instituted. He does now. Setting a good example is not enough. Rules and curfews can be broken, but increased awareness, increased sensitivity, and close scrutiny is called for when temptation is easily accessible to untested individuals.

The mishap occurred on takeoff for an FCLP period. The pilot was the last to take off in a four-plane flight.

The previous night he was known to have consumed several beers and some wine both during and after dinner. It was also known that he had no more than 4 hours sleep, having spent considerable time in town. His presence was noted in the BOQ early in the morning and he awakened his wingman at 0500. He appeared ready to "whip a bear with a switch" and was eager to start the day.

Following breakfast, the flight mustered in the readyroom for briefing. Included in the briefing was a thorough discussion of aborted takeoffs.

Upon lining up for takeoff, the flight was alerted by the tower that there were numerous birds in the vicinity of the airfield. None of the first three aircraft to take off encountered any birds, but two pilots reported seeing birds on the side of the runway.

With 8,500 feet of runway available, the mishap pilot lined up for takeoff. In a later analysis of the mishap, witnesses stated that the aircraft rotated at approximately the same spot that the preceding aircraft had become airborne. From that point, less than 5,000 feet of runway remained.

After becoming airborne the aircraft made a steep vertical left turn in a bank of almost 90 degrees. It crashed and was engulfed in a fire as it slid down the runway. The pilot was killed on impact.

Several reliable witnesses were interviewed concerning their views of the takeoff.

One pilot stated: "The first three had no problems, but as the last plane rotated to almost 30 feet, it veered sharply to the left. The left wing was nearly vertical and then the aircraft suddenly dropped, hitting on the left wing."

A RIO who was on the way to his aircraft responded: "At first the takeoff seemed normal, but then the nose came up sharply and he veered left. The aircraft appeared to stall and then crashed."

When the EI was received from the NARF, it confirmed that a compressor stall had occurred from FOD damage. No determination was made as to the source of the FOD, but there was no evidence of a birdstrike.

The CO's policy of individual pilot responsibility concerning mental and physical preparation for each flight was well understood by the squadron. If any pilot knowingly violated the 12-hour rule for imbibing alcoholic beverages, he had the CO's permission to remove himself from the flight schedule (the first time) and was expected to do so. There would be no repercussions for this "first time" violation. The mishap pilot was known to have violated the 12-hour rule on the night prior to the mishap.

Because of degrading thrust and noises associated with compressor stalls, the pilot should have considered aborting his takeoff. He had half the runway left plus arresting gear available to stop him.

Several possibilities were advanced for his reaction to the emergency; a pullup to miss a bird, jet wash from the preceding aircraft, an instinctive reaction to pull back on the stick when startled by an unexpected noise or explosion, or some other catastrophic occurrence. Whatever the cause, the aircraft departed from controlled flight.

The mishap pilot was not known for flagrantly violating the 12-hour rule. His lifestyle was one of conformance to accepted standards, and this instance was his only known violation.

It became evident that **numerous personnel in the supervisory chain had detected his unauthorized behavior.** The fact that no one took any action is regrettable, as it may have prevented the mishap.

Aviation is far more than carrying out prescribed procedures. It demands our constant attention and consideration in command policies and supervisory decisions as well as the good judgment we have come to expect from those whose hands are on the sticks or wrenches.

How many yellow flames will it take for us to learn this?

A Wild Ride

By LT Colin W. Sargent

"The pilots could see only briefly, during periods of negative G, when the overhead circuit breaker panel would drift up and out of their field of vision, only to come slamming down again on their heads."

STATES and souls. The ripple check flashed through the predawn darkness as the pilots on LPH Spot 5 began their takeoff checklist. Fifteen combat-loaded Marines were already aboard the CH-46E, waiting to be inserted into this week's jungle. Both Spot 4 (directly forward of Spot 5) and Spot 7 (directly aft) had turning *Sea Knights* on them as well.

Winds were within limits.

The slash was jammed with CH-53s.

CH-46s with blades spread were occupying Spots 2 and 3. Because the *Sea Knight* on Spot 4 was a little behind in the loading sequence, the Air Boss elected to launch Spot 5 first.

With the takeoff checklist complete (including ASE and SAS on), the HAC pulled into a hover. The crew felt a slight lateral shuffle, as if a blade were barely out of track, but it didn't seem to be a real problem. After the copilot checked the instruments, the HAC eased in some up collective and left forward cyclic to slide out over the water.

Suddenly, the one-per-rev beat intensified tremendously and became unbearable. Immediately deciding to abort the takeoff, the pilot smoothly reversed his cyclic for a slide to the right.

The pilots turning on Spot 7 could see that BOBCAT 17 was having extreme mechanical problems. To observers in PriFly, glassed behind the ricocheting pieces of sound, the diagnosis was even more simple — it looked as if the *Sea Knight* were coming apart in the sky. Of course, all this was happening very quickly, in the same amount of time it took the HAC to transmit, "I've got problems!" on UHF.

Then the unbelievable happened. Before the HAC could wrestle BOBCAT 17 back across the deck edge, the overhead circuit breaker panel vibrated loose from its retaining nuts and slammed into both pilots' heads. The blow forced the HAC's head down and to the right (and probably his arms down on the collective and forward on the cyclic), and the aircraft dipped below the deck edge in a nosedown attitude.

As the HAC fought to retain control, the helo pitched into a nose-high attitude just as the starboard stubwing cracked into the port catwalk. A heartbeat later, the aft rotor blades (fiberglass) bit into the flight deck. The helo then gained altitude until it was in an unstable hover over the aircraft turning on Spot 4. BOBCAT 17 was obviously responding poorly to controls as it pitched back over the aircraft on Spot 7, then forward again, all the while throwing the crew about wildly.

Dangling from overhead wires, the circuit breaker panel blocked as much as 75 percent of the windscreen while striking the pilots repeatedly on the head and neck. Both fliers could see only briefly, during periods of negative G, when the circuit breaker panel would drift up and out of their field of vision, only to come slamming down again on their heads.

Next, the *Sea Knight* started to climb right and up toward the island and the spotted CH-53s. Noting that the HAC was, of necessity, focusing most of his attention on staying clear of the swirling rotor discs on Spots 4 and 7, the copilot added some up collective and left cyclic to avoid hitting the parked *Sea Stallions*. By now, the aircraft was hovering 40 to 50 feet over the CH-53s on the aft slash, periodically drifting over Spot 7. The HAC, feeling the copilot on the controls, said, "I've got it!" and, hearing the overtorque horn, decided he had to put his *Sea Knight* down immediately — anywhere on the flight deck.

Still fighting the bouncing circuit breaker panel, he rolled left cyclic, muscled his way back toward Spot 5, leveled the helo, and nailed it straight down less than 4 yards off the spot.

BOBCAT 17 hit hard, collapsing both main strut oleos, flattening all main landing gear tires, and separating the

airframe at Station 410. Feeling the aircraft go immediately into ground resonance, the HAC shouted "ECLs!" and the violently vibrating helo was shut down. An aft blade hit the tunnel, severing the sync shaft. The forward and aft heads then flew out of synchronization, leading to blade-to-blade contact.

Result? Everyone walked away. The 15 Marines conducted a calm and controlled egress, and no one in the aircraft experienced injuries more serious than a few bruises, several sprained necks, and some chipped teeth.

The Assistant Air Boss saw the final moments this way: "The Air Boss yelled, 'Get it down, land it!' Somehow, the pilot was able to land on Spot 5 — less than 4 yards off the mark — with turning CH-46s on Spot 7 and Spot 4 and CH-53s in the slash. A truly superb piece of airmanship! Once the aircraft was on deck, it vibrated so violently that panels were falling off. The crew is a shoe-in for Pro of the Week, Bravo Zulus, and air medals."

Because of extensive crash damage, no causes for the lateral beat could be identified. SAS amplifiers and SAS links were found to be capable of normal operation and didn't contribute to the cause of the mishap. As far as the overhead circuit breaker panel is concerned, one possibility is that the wingnuts securing the panel may not have been properly tightened following the helo's last phase inspection. In the wake of the mishap, a check of all squadron CH-46Es revealed that three other *Sea Knights* had improperly-secured overhead circuit breaker panels.

Mishaps are especially frustrating when precise cause factors can't be identified. Still, we do know that some fairly recent CH-46E airframe changes helped keep this bird together, notably the fiberglass blades (they shatter more "gently" than metal), the additional power available in E-series *Sea Knights*, and the aircraft's crashworthy fuel cells.

The best part of this story is entirely human: a courageous and fully-trained aircrew at the controls may well have made the difference between a Class B mishap and a far greater loss in aircraft as well as lives.

By the way, have you looked at your own circuit breaker panel wingnuts lately?

A few dark minutes

By Capt Dave Winston, USMC
HMH-461

WE had half a tank of gas, half a pack of cigarettes, it was getting dark and we were wearing sunglasses. No, we weren't Joliet Jake and Elwood Blues — we were a flight of two en route to a carrier for some night CQs. Visibility was unlimited, and our floating destination was 106 miles away from our LPH.

This all transpired 3 to 4 days into a TransLant. Anyway, as a young and impressionable copilot, I was looking forward to my first night CV landing in the CH-53. Although not all that enthused about riding in the back while one of my shipmates performed that death-defying act, I acquiesced and decided to sleep till it was my turn in the barrel.

During the ODO's brief, we were given frequencies, call signs and pigeons (the first time I'd heard the word denote anything besides a bird of the family *Columbidae)* for the flattop along with our homeplate's PIM (Position of Intended Movement). The section brief, aircraft brief and preflight were routine. When we looked at the book, we found that Dash 2 had no FM. Naturally, we changed the radio procedures to alleviate this problem.

After takeoff, we switched up to Helicopter Direction Center and were given pigeons (this time, it meant a person who is easily fooled) that were way off our TACAN lock-on (the ODO had briefed a two-letter identifier and we now had a strong three-letter identifier for the same TACAN station . . . MEACONING, no doubt) for the big deck. We questioned this with HDC and were informed that they were sure our TACAN was incorrect and that we should continue to fly the assigned heading. We tucked that away for future reference and made a note to save some gas. By the time all this had occurred, I was half asleep and didn't really begin to focus on the present until the aircraft banked left. Expecting to see my first big deck, I looked out and got the surprise of my young life. I didn't see a thing! I checked my watch; we should have been there. One quick 360 of the horizon made me think of the HECKAWEE Indians.

I wandered up front, put on a gunner's belt and watched a silent movie on how to figure your max endurance vs. max range airspeed. The pilots were frantically switching the radios with an obvious lack of response. I then increased my mixer volume and found we'd lost radio contact, TACAN and a bit of sweat. The HAC remained up Strike and discussed alternatives with Dash 2.

A few dark minutes later, we heard some chatter on Strike and queried for a call sign. After the raucous laughter subsided, we were asked to authenticate. Naturally, we didn't have authentication tables and said so. We kept calling — it was like that busy signal we all hated when trying to check the flight schedule at Pensacola. Finally, our flight lead said that if they wouldn't talk to us, we'd have to make a controlled landing in the water rather than try to stretch it. I started to check my survival equipment. (That's when I wished I'd written down the water temperature.) I also learned that water bottles are optional — not only that, but we even have to fill them ourselves (how declasse)! By the way, Mr. Know-it-all, do *you* know how the MK-12 liferaft works and what kind of provisions it has?

Not so fast. Bear Aces to the rescue. An intrepid *Intruder* flier took pity on us and painted us with his plotter. We gave him our state, and he said we'd never make it to our deck. That was good news! Well, anyway, the big deck put the grovotnick to the firewall and turned toward us. I was never so happy to see a ship in my whole 3 days of deployed time. We had a "See-Me" at 63 DME! She slowed below the speed of light so we could come aboard. Scared? You bet. Do it again? Not that way. Lessons learned? Many. Here's a partial list.

- Get your experience by proxy. (Talk to those who've been there.)
- Plan all contingencies. (Even the ones that always happen to the other guy.)
- Cover the ditching procedures. (Talking and doing are

light-years apart.)

• Know your survival equipment and how to use it blindfolded. (Even if you do have to fill your own water bottles.)

• If pigeons differ from onboard instruments, get a confirmation you'd stake your life on. (You may have to.)

• Compute your Bingo profile well in advance. (Always keep an eye on your state.)

• Know who's got your pigeons.

• Turn around with more than half a bag. (Unless it's an LPH, it'll move while you're gone.)

• Get the PIM before you go. (Not that it'll do any good without an Omega.)

• Make a controlled landing vice an actual flameout approach. (Autorotation — a scientifically-designed maneuver to occupy your hands and feet while you fall violently to your death.)

After it was all over, we called for takeoff:

"Your pigeons are 367 at a thousand — just kidding." Then we settled down to some nice, quiet night CQs.

You're on fire, *EJECT!*

By LTJG K. J. Hettermann
VA-146

"My next recollections were of an aircraft very close to me, an extremely sore right arm, and a mouthful of blood and chipped teeth."

FLYING along in a 20-plane Alpha strike during a CV evolution east of Africa, I recently had the opportunity to save my life (thanks to my survival training). As Dash 2 in a three-plane formation of *Corsairs*, I was about 50 miles from the ship when my trusty old TF-41 announced its impending failure with severe vibrations. A quick glance in the cockpit showed the ENGINE HOT light on and turbine outlet temperature out of limits. I deployed the Emergency Power Package (EPP), turned back to the ship and pulled the throttle to idle. Idle didn't help, so I shut down the engine (my one and only)!

After about a minute of windmilling, I attempted an airstart in manual fuel control. Encouraged by positive indications, I transmitted to my wingman that I had a good airstart. He told me to set 80 percent RPM, and as I advanced the throttle, the shaking and rumbling returned. The temperature once again climbed out of limits. With the throttle at MRT, the engine RPM was at 75 percent and unwinding. It was at this point that I first considered ejecting.

As I passed 5,000 feet, I made the decision to attempt one last relight and eject if it were unsuccessful. Going through the airstart procedures, I was interrupted by my wingman's transmission of "You're on fire, eject!" Pure reaction took over, and I initiated an immediate (vice a controlled) ejection. I grasped the lower handle with my right hand, sat back in the seat a bit, and yanked on the handle for all I was worth.

My next recollections were of an aircraft very close to me, an extremely sore right arm, and a mouthful of blood and chipped teeth. My wingman later told me I had a full chute right behind my A-7's tail section. Now, information from numerous survival lectures started paying off as my thoughts turned to IRSOK (inflate, release, snap, oxygen, Koch). I *inflated* my LPA but had to pull both beaded handles with my left hand since my right arm was incapacitated. I next fumbled between my legs for 2 minutes in an attempt to *release* my raft (I was evidently reverting to my first survival training in T-28s). A combination of wearing my lapbelt a bit loose and the opening shock had suspended the seat pan lower than I expected. I was unable to release the seat pan handle due to my sore right shoulder. The inflated LPA precluded using my left hand to reach across and open it. I decided to move on and complete the rest of the IRSOK steps.

I *snapped* my LPA lobes together and, upon getting to the "*O*" in IRSOK, realized that my mask and helmet had been ripped off during the ejection. I now saw my wingman flying in front of me, and this keyed me to try my PRC-90 and tell him I was all right. As I looked down, I saw that my PRC-90 was gone. (Because our PR shop is low on PRC-90s, we check them out before each hop, and I believe I failed to button the snap down and attach the lanyard.)

Deciding not to worry about my Koch fittings until I descended, I turned my attention to my seat pan again. Failing to open it, I felt I had to get rid of its excess weight prior to water entry. I released my lower Koch fittings, causing the pan to drop about 5 feet and to the left. It was hung up in the left hand riser. I pulled it up and attempted to open it again, with no success. Then I tried to pull the strap away from the left riser — also no go. Approaching water entry, I used my left hand to position my right hand in the upper right Koch fitting. As my feet hit the water, I released both fittings. Surfacing, I saw the parachute about 10 feet away. My wingman was flying nearby, so I assumed he had me in sight. Pulling out my day/night smoke, I awaited the arrival of the helo. While my wingman circled above during the waiting period, I waved at him to let him know I was all right but kept my movements to a minimum with thoughts of "Jaws" in the back of my mind.

Hearing the helo coming, I tried to crack open the day side of the flare with negative results. I opened the night side and pulled the cap away to ignite it — nothing happened. By this time, the helo was passing me by, so I started kicking, splashing and waving. They turned back toward me. A flawless water pickup was executed by our superb helo squadron. Upon my return to the ship, I was admitted to the medical ward with time to review the events of the day.

Lessons brought home to me during this incident were:

- I hadn't planned on an incapacitated arm in my survival training.
- Never assume someone has sight of you in the open ocean. In my case, he didn't.
- Although distracted by the thought of fire, I still had time but failed to grasp my right hand with the left (which would have reduced my flail injury).
- I wasn't as familiar with my survival gear as I should have been.
- In my case, the decision to release the raft turned out to be smart considering the entanglement. However, in the event of a prolonged stay in the water, it could have been a disastrous decision.

I had a lot of things going for me in this ejection. First of all, I had a wingman who did an outstanding job as on-scene commander. (How many crewmen know their SAR procedures?) He gave the helo a good vector from the crash site to where the parachute had splashed. I was also lucky that the incident happened during the day, because with my lack of signaling devices, it would've been difficult to locate me at night.

I also learned the importance of checking for parachute entanglement, since it would have further complicated water entry. My squadron took action on these problems by having all pilots participate in a "parachute hang" while being confronted with various incapacitations. I was dazed throughout the evolution until water entry, and the endless training and survival lectures proved their worth. Finally, I believe in being physically fit, and it payed off. I sustained no major injuries, and although I was really stiff and sore for several days, I was back in the cockpit the third day after the mishap, grateful for a safe past and determined to have an even safer future. ◄

LETTERS

The Straight Scoop on F/A-18 Aeroconical Parachutes

Washington, DC — I read "F/A-18 Ejection" in your October 1982 issue with interest since one of the prime purposes of *APPROACH* is to provide useful and factual safety information to the naval aviation community. While limited hazards are present with aeroconical parachutes, I am concerned because your article implies that the F/A-18 aeroconical parachute is extremely hazardous and does not meet applicable specifications. As presented, the facts surrounding this incident may cause excessive and unjustified concern in the F/A-18 operating community.

I am enclosing an amplification of the critical facts relevant to this ejection. Partial facts or misleading information presented to our operating community may in themselves generate a safety hazard. While the F/A-18 escape system is being modified to further enhance the safety of the ejectee, the system does meet existing specification criteria.

FACTS RELEVANT TO THE F/A-18 PT. MUGU EJECTION:

- High winds were present during the Pt. Mugu ejection. Ground winds above 15 knots are considered unsafe even for experienced parachute jumpers. Unfortunately, the low altitude of this ejection did not allow sufficient time for the pilot to steer the parachute into the wind. The parachute aligned with the wind and the natural horizontal glide of the parachute became additive to the wind velocity. Had the parachute turned 180 degrees, the effective touchdown velocity would have been reduced by a significant amount.
- The applicable specification, MIL-S-18471, requires the parachute descent rate to be "equal to, or less than, 30 ft/sec total velocity with a vertical component no greater than 24 ft/sec." When the vertical velocity is 24 ft/sec, the horizontal velocity can be 18 ft/sec and still meet the total velocity requirement. These requirements are for ICAO standard day conditions —no wind.
- In the Pt. Mugu ejection, parachute touchdown velocity was determined to be 58 ft/sec. Assuming a 22-knot wind, we can factor out the wind input and evaluate parachute performance against the specification. Fortunately, sufficient video coverage of the ejection permitted a fairly accurate assessment of parachute performance. The pilot's vertical velocity at touchdown was 22 ft/sec, which is well within the specification. His horizontal velocity was 53.7 ft/sec, which equates to 16.5 ft/sec when wind velocity is factored out. This computes to a no wind total velocity of 27.5 ft/sec, which is well within the specification.
- The parachute's contribution to injury in this case cannot be ignored. The glide feature of the chute was incorporated based on combat experience which indicated that a gliding chute would enhance escape and evasion possibilities. The glide feature, in this case, did increase touchdown velocity by 25 percent. This accident clearly proved that the specification is wrong since it permitted uncommanded gliding — a hazard under certain conditions. Emergency parachutes should glide only when commanded by the ejectee. The specification and the F/A-18 parachute are being changed to preclude this problem in the future.
- What are the hazards for F/A-18 pilots? For low altitude ejections with ambient winds over 10 knots, there is a higher probability of injury if the parachute aligns with the wind. It is equally probable that the parachute will align against the wind, which would decrease landing velocity. For higher altitude ejections, the parachute is fully steerable and can be turned into the wind to provide a softer landing. This parachute is not considered a hazard unless the noted conditions are present.

VADM E. R. Seymour, USN
Commander
Naval Air Systems Command

Walking Through A Pocket Checklist

Seattle, WA — Your October 1982 issue of *APPROACH* contained the story "It Can't Happen to Me!" which passed along some lessons learned by an F-4 RIO who survived a successful low-level ejection.

I'd like to take a moment to mention something that might help us all be a little bit more prepared for trouble. Part of this aircrew's problem was caused by an F-4 NATOPS "Murphy."

This particular crew was required to make a single-engine, utility hydraulics and power control failure approach to landing. This is one of the more challenging malfunctions, and crew coordination is a must. The NATOPS Manual is pretty clear about how critical airspeed control is to the entire problem: under "Single Power Control and Utility System Failure" Step 1 reads:

"1. Reduce speed below 500 knots (no less than 220 KIAS)

WARNING

Do not allow airspeed to drop below 220 KCAS."

Under "Utility System, Single Power Control and Engine Failure" is the equally ominous statement:

"Aircraft handling characteristics are of the same nature as with utility and engine failure. However, lateral control is more critical due to the loss of aileron and spoiler on one wing.

WARNING

"For any of the above combination failures, maintain a minimum maneuvering airspeed of 230 knots. Yaw and roll encountered with asymmetric thrust and heavy weight significantly degrade handling characteristics when operating below 230 knots. Avoid rapid roll rates, rapid or large thrust changes, and turns toward the inoperative aileron/dead engine. If turns are required, minimum bank angles should be used."

OK! That's clear to anyone who reads it and the aircrew should have that committed to memory, right? Not quite true! In the F-4 community, the immediate-action emergencies are memorized and then the aircrews are expected to review the pocket NATOPS that they carry in the cockpit. (If you guessed that we're about to meet Murphy . . . you're right.)

In the pocket checklist under "Single PC and Utility Sys Flr" we find:

"1. Reduce speed blw 500 knots
. . . 9. Perform controllability check"

Under "Utility sys + Eng Flr" we find:

"1 Reduce speed to 250 knots
. . . 9. Perform controllability chk + investigate LDG aprch characteristics. Aprch spd is 230 knots until wings level on final then fly min control spd + 10 knots.
10. Plan straight-in aprch with all turns away from dead eng."

Would you recognize the emergencies by their pocket NATOPS checklists? Would you remember the WARNING under the stress of the actual emergency?

Well, thanks to the instructors at the Navy F-4 Reserve at NAS Miramar, I saw in the 2F88 simulator how my pocket NATOPS didn't always present the whole picture in an easy-to-refer-to way. Part of the key to planning beforehand for any emergency is study of the manual, discussion with experienced aircrew, and time in the aircraft. An equally important part is to ensure that this knowledge is available when needed. If that requires writing additional notes in your pocket NATOPS — go for it!

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COMFAIRWESTPAC

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ARE CHARMING,

HANDSOME, DASHING,

DEBONAIR, WITTY, AND VERY,

VERY POPULAR WHEREVER YOU GO.

NOW THAT WE HAVE YOUR ATTENTION, ALWAYS

MAKE IT A POINT TO BUCKLE YOUR SEATBELTS AND

ARRIVE ALIVE. YOUR VISION AND FORESIGHT WILL BE APPRECIATED.


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You need them
if you ever want to reach
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